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**Nuclear reprogramming to a pluripotent state by three approaches.**

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**Funding Grants:** Regulation of Stem Cell Fate in Bioengineered Arrays of Hydrogel Microwells, Molecular Mechanisms of Reprogramming towards Pluripotency

**Public Summary:**

**Scientific Abstract:**

The stable states of differentiated cells are now known to be controlled by dynamic mechanisms that can easily be perturbed. An adult cell can therefore be reprogrammed, altering its pattern of gene expression, and hence its fate, to that typical of another cell type. This has been shown by three distinct experimental approaches to nuclear reprogramming: nuclear transfer, cell fusion and transcription-factor transduction. Using these approaches, nuclei from 'terminally differentiated' somatic cells can be induced to express genes that are typical of embryonic stem cells, which can differentiate to form all of the cell types in the body. This remarkable discovery of cellular plasticity has important medical applications.

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